

WA State Biofuel Cropping Opportunities and Challenges

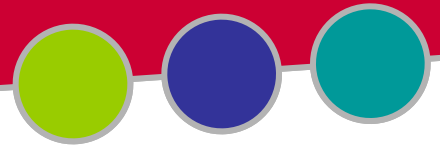
Oilseed Production Workshops

Omak, Reardan, Colfax

Jan. 25-27, 2011

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Washington State University*



PNW Oilseed Production?

*Where are you on
Levels of Letterman?*

1. Is this something on nothing?
2. Will it sink or float?
3. That's what we're talkin' about!

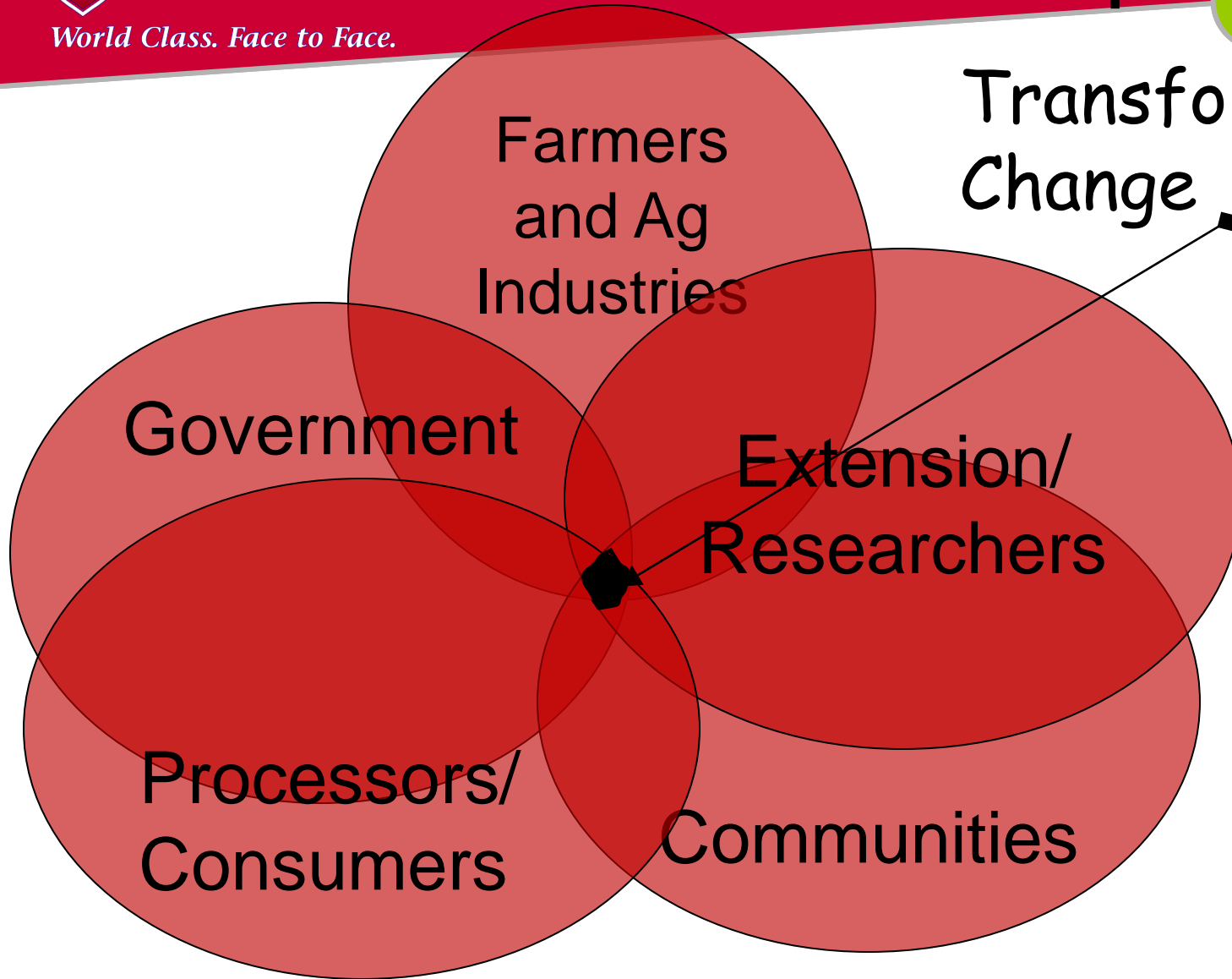
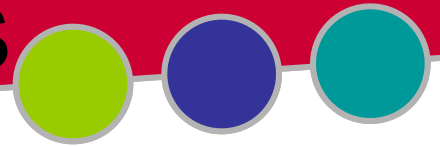


We're Talking About Transformational Change

- Energy
- Farming
- Community
- Environment



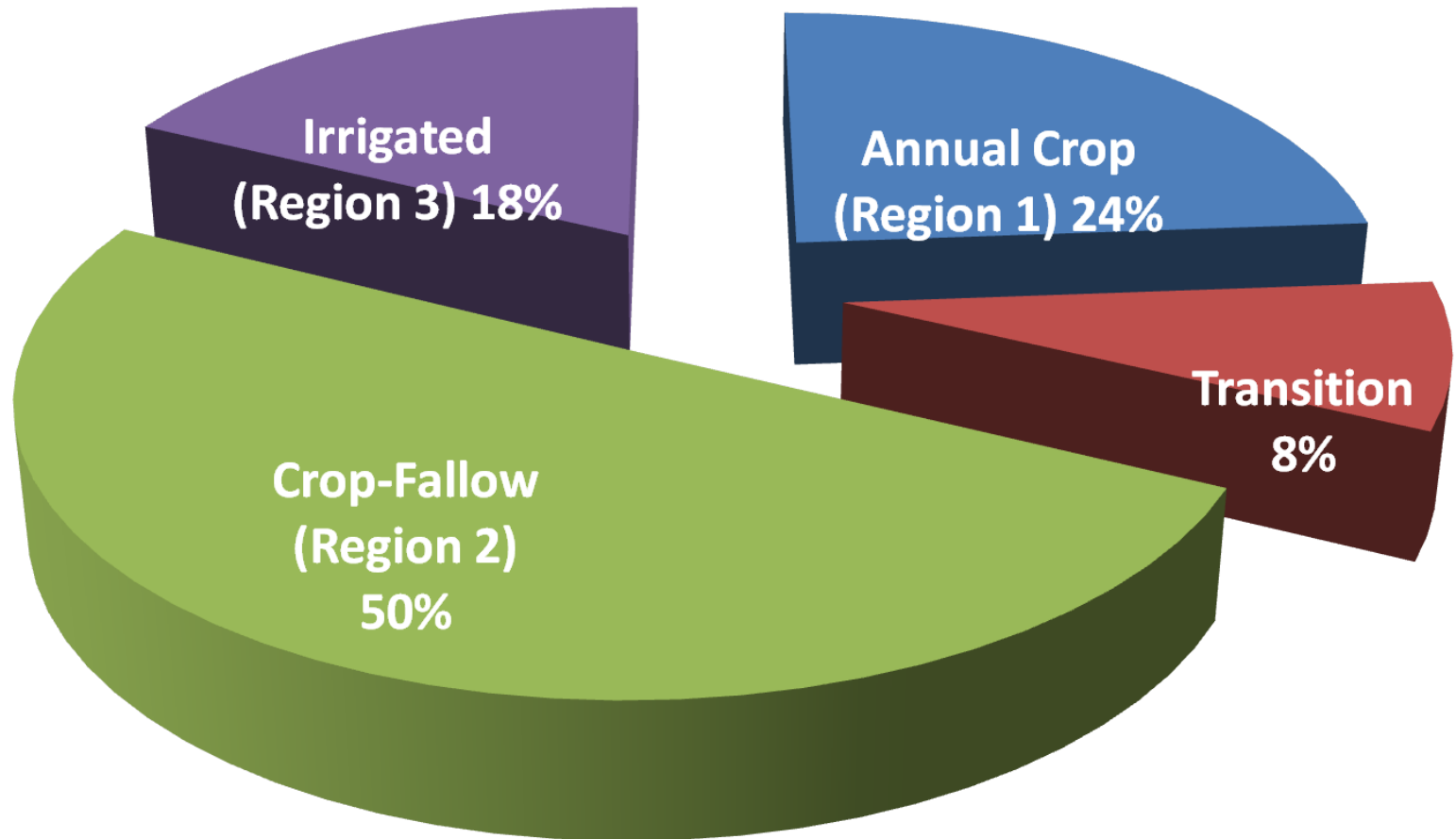
Vital Partnerships

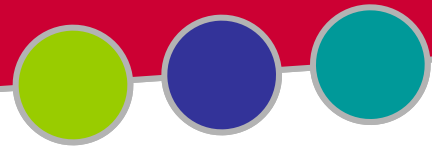


Transformational
Change



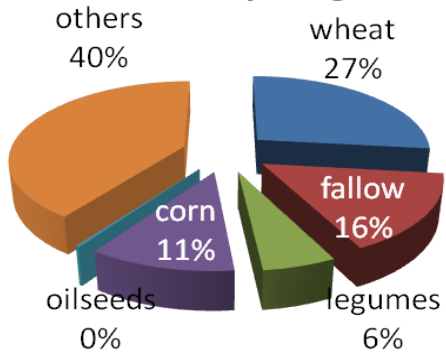
Inland PNW Zone Acreage



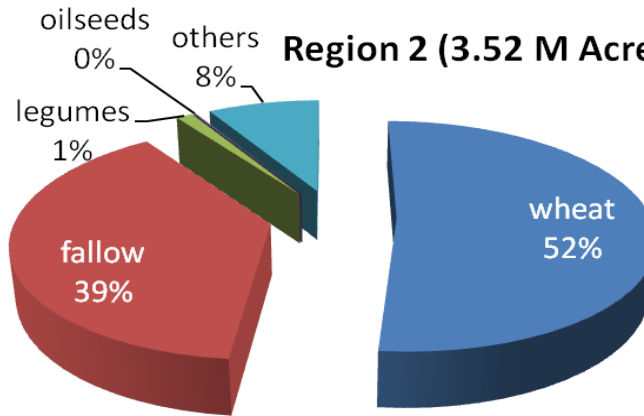


Region 3

(1.24 M Mostly Irrigated Acres)

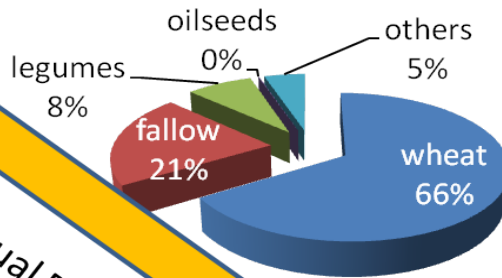


Region 2 (3.52 M Acres)

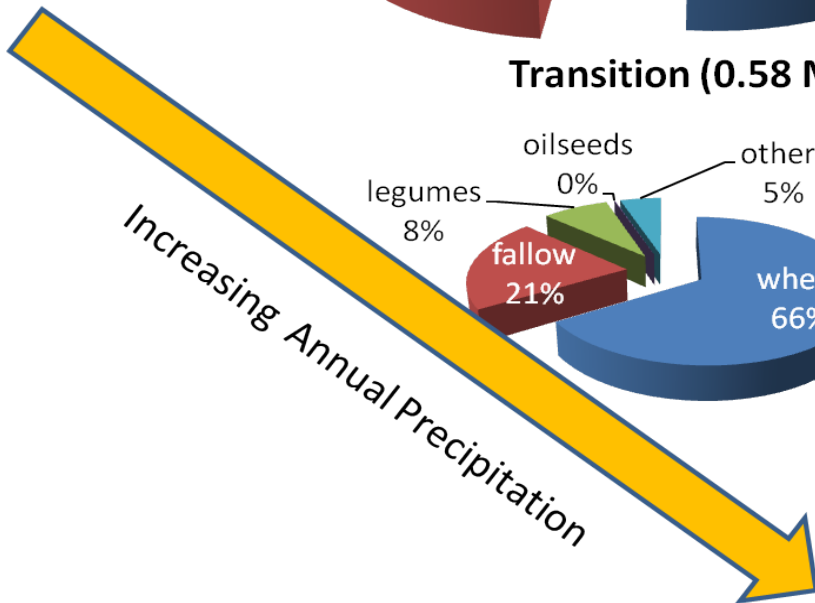
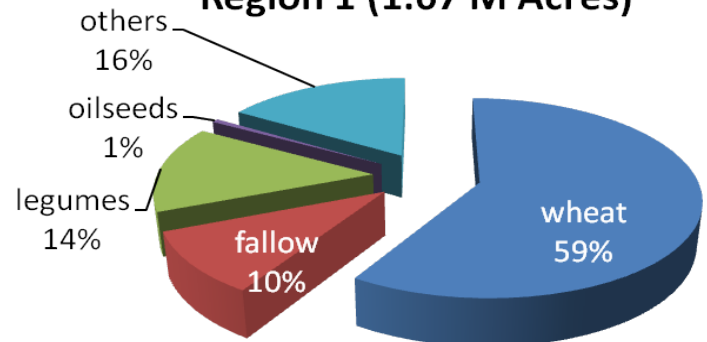


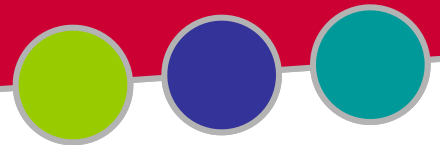
Inland PNW
AEZ Crop
Distributions

Transition (0.58 M Acres)



Region 1 (1.67 M Acres)





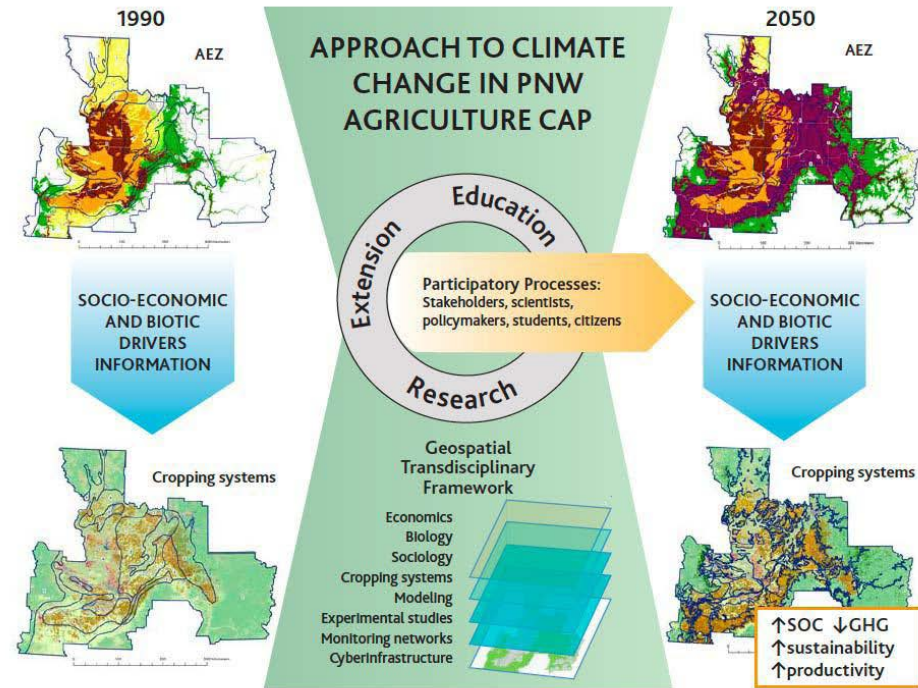
Resources, Support

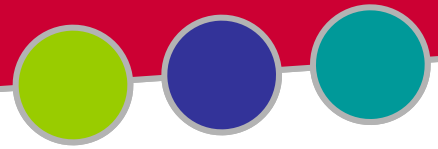
- WA State Biofuels Cropping Systems Program
 - Supported by WSDA, Commerce, Ecology, Governor's Office
 - 20+ State and USDA researchers
 - 4 statewide cropping zones
- Sustainable Aviation Fuel Network
 - Fuel processors, US Military, SEATAC, Boeing, Airlines
 - USDA proposal: Farm to Fly (S. Hulbert, PI)
- Life cycle analyses to ensure +energy, sustainability: EPA, WSU
- USDA Regional Biofuels Center
- USDA AFRI Cropping Systems and Climate Change



Oilseeds' Role in Climate Change Mitigation and Adaptation

- Short season crop, high water and N use efficiency
- Biodiesel production/use emits 50% less GHG compared to diesel
 - EPA LCA finding, 2010





WA, ID, OR, MT Sustainable Aviation Fuel Network USDA Proposal (S. Hulbert)

- Camelina
- Industrial oilseeds



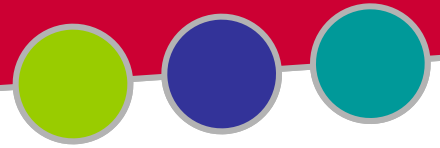


Regions 1, 2 – Eastern WA (rainfed)

Production Issues for WA Canola

- Fall germination in dry soils
- Winter kill
- Spring frost kill
- Fertilizer sensitivity
- Heat stress at flowering
- Weed, insects, pathogens



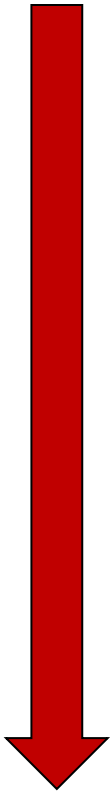


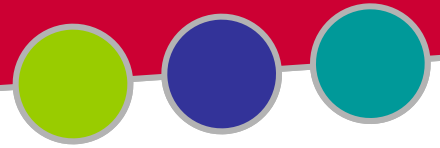
Regions 1 and 2 Oilseed Adaptations

Zone 2-fallow

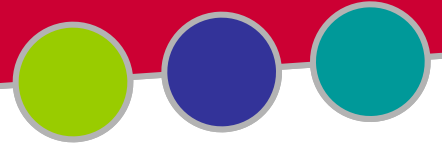
- Mid-summer seeding of winter canola into fallow; replacement of winter wheat
- Biennial canola: summer seeded winter canola in fallow: yr 1-forage, yr 2- grain
- Flex cropping spring oilseed into wheat-fallow
- Oilseed replacement for transitional zone fallow
- Spring oilseed alternative to spring legumes or cereals

Zone 1-annual cropping

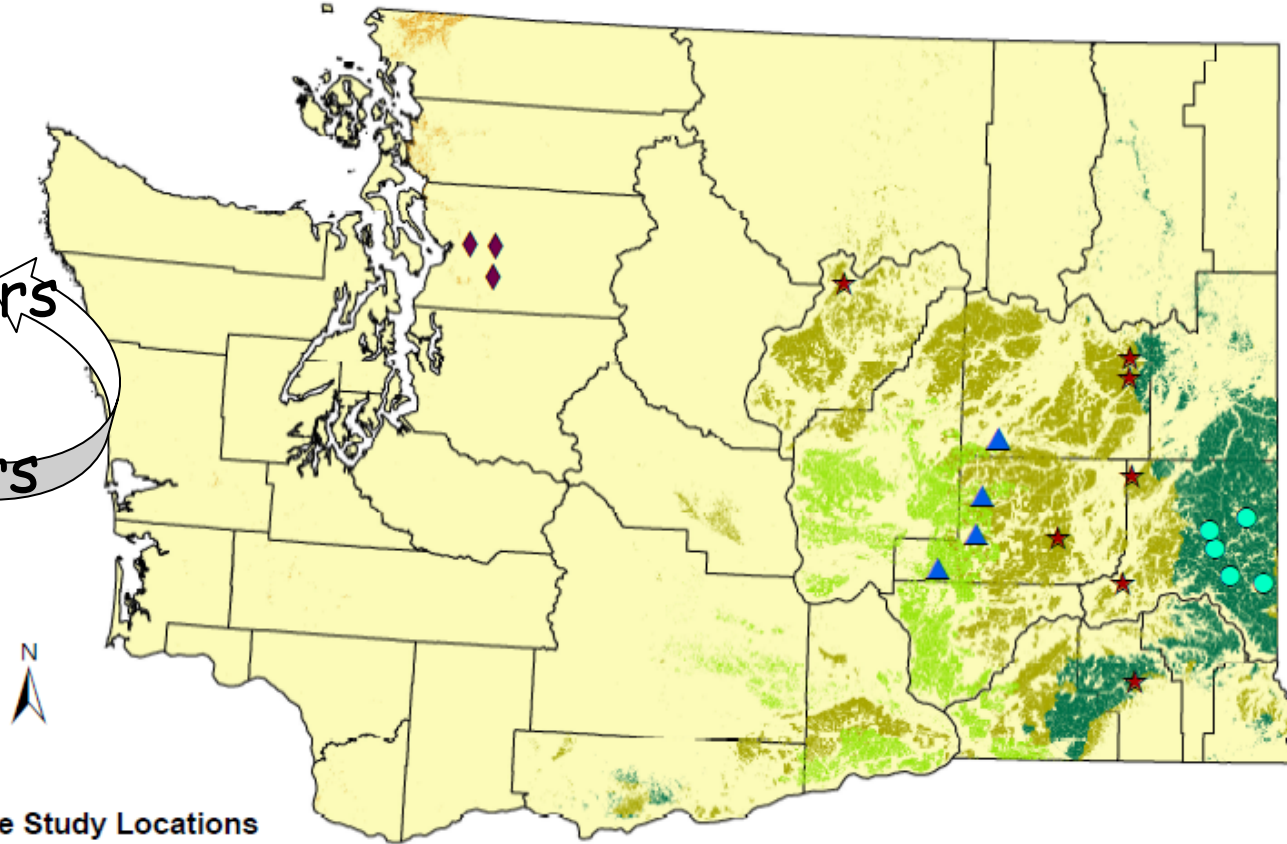




- Seeding
- Fertility
- Genetics
- Pest management
- Economics
- Byproduct use



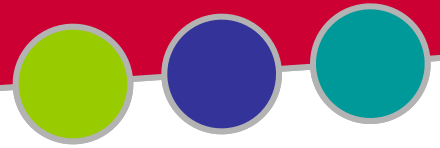
Regional Production Zones and Grower Cases



Case Study Locations

● Region 1	17" - 25" Rainfall Cropland	1325321 acres
★ Region 2	< 17" Rainfall Cropland	2339258 acres
▲ Region 3	Irrigated Cropland	996071 acres
◆ Region 4	Western Washington Cropland	62453 acres

Crop data is from the 2009 Cropland Data Layer from the National Agricultural Statistical Service of the U.S. Department of Agriculture.
 Map projection is Universal Transverse Mercator, zone 11, WGS 1984.
 Map created by Richard Rupp, Department of Crop & Soil Sciences, Washington State University.



Crop Diversification Benefits

- Market diversification
- Improved weed control
- Soil tilth, C sequestration
- Improved WUE, NUE
- Higher wheat yields





The Basic Differences

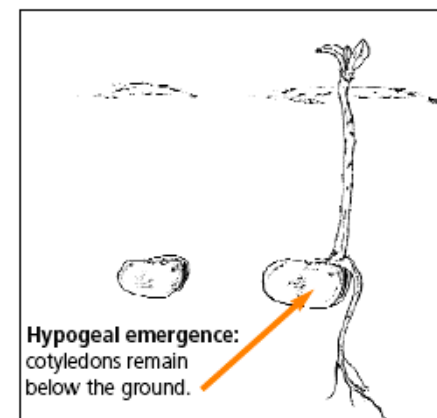
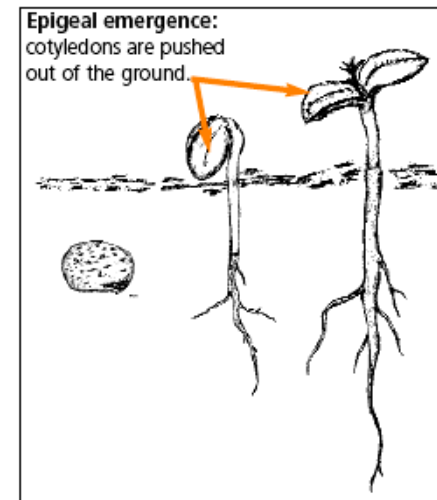


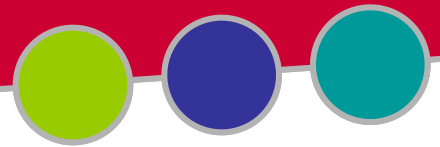
Oilseeds

- Dicot broadleaf
- 3 years of WA integrated research
- Shoot meristem above ground
- One tap root, extensive laterals and root hairs
- High N uptake efficiency, high N carryover
- RR varieties available
- Local demand for food, feed, fuel

Cereals

- Monocot grass
- 100 years of WA integrated research
- Shoot meristem below ground
- Multiple seminal root axes
- Moderate N uptake, low N carryover
- No RR wheat
- Exported food





WA State Biofuel Cropping Collaborating and Supporting Agencies



Department of Commerce
Innovation is in our nature.



United States Department of Agriculture